entitled under the federal Endangered Species Act (ESA). The participating experts were specifically requested to judge the scientific merits of the Simpson proposal.

Regarding the decision standards, it is understood that while the proposed plan may allow the "incidental take" of covered species, such take may not permissibly "jeopardize" the continued existence of these species, nor "appreciably reduce the likelihood of the survival and recovery of the species in the wild." There must further be a rational basis for the decision agencies' finding that these decision standards are met.

B. Questions Posed by Reviewers

Assumptions: Are key assumptions clearly identified? Are they sound? Is justification provided for the assumptions based on expert opinion?

Goals and Objectives: Are the goals and objectives clearly stated? Are they sound? Does the plan establish metrics of land use pattern and practice and for watershed condition that correspond with maintenance and recovery of habitat condition sufficient for local persistence and/or rangewide recovery of the covered species and subspecies? Does the plan identify specific variables to describe habitat condition, including threshold criteria for suitable and high-quality habitat?

Adequacy of Baseline Data and Process Analysis: Are the current and historic conditions described? Is the ecological path for getting from historic to current condition understood? Does the plan adequately reference key source data, theoretical principles, and analysis or analytic methods? Are physical, chemical and biological processes examined, and are interactions in the covered watersheds understood?

Species Demographic and Genetic Data: Are status and trend data available for key populations and reported and interpreted in the plan? Is the biology of all life stages discussed and is justification provided for the choice of conservation measures relative to the life-cycle and mortality sources and magnitudes of each life stage?

Adequacy of Management Direction: Are sensitive and priority habitats adequately delineated (e.g. riparian areas, unstable areas, high quality habitats)? Are risks to habitats and species adequate to attain stated objectives and/or those required for species survival and recovery?

Restoration: Does restoration of impaired watershed processes occur under the plan? Is there a valid ecosystem assessment that links species and site-specific recovery or restoration measures to ecosystem organization and processes and evaluates the likely success of recovery measures in this context?

Monitoring: Are monitoring plans adequate (spatially and temporally)? Are these efforts capable of ensuring attainment of objectives? E.g. are methods identified for measurement and monitoring of habitat conditions relative to biological thresholds, if any?

Response to Comment G10-16

See Master Response 3, discussing the cumulative effects analysis. See also responses to Comments G10-32 through G10-38 regarding cumulative watershed effects. Measures to address hydrology, peak flows and the reduction of sediment input to Plan Area watercourses have been provided in the Operating Conservation Program (AHCP/CCAA Section 6.2).

Response to Comment G10-17

See Master Response 1 and the response to Comment G9-4 regarding baseline.

Response to Comment G10-18

See Master Response 1 regarding baseline, which explains why a comparison between expected conditions with and without the Plan and Permits is appropriate. The EIS includes a comparison of existing baseline conditions and expected future conditions under the No Action Alternative and a comparison of conditions that would result under the Proposed Action and other action alternatives. See also the response to Comment G10-55 regarding the importance of Green Diamond's holdings in the Klamath Basin.

Transparency of Analysis with Respect to Decision Standards: Is there presented a rational analytical basis for a finding that the applicable decision standards have been met? Specifically, (1) is the harm to affected species from the proposed management assessed using best available scientific information? (2) is there a sound basis for a finding that the proposed action will mitigate for this harm (i.e., the incidental take) to the maximum extent practicable? (3) is there a sound basis for a finding that the survival and recovery standards of Section 10 and the jeopardy standards of Section 7 are met?

II. OVERALL FINDINGS

Key concerns of the panel are summarized below:

G10-16

+ **There is no basis upon which to find that the proposed management prescriptions will effectively limit ongoing harm to the covered species arising from cumulative watershed effects, particularly those associated with alteration of sediment and hydrologic regimes.** Instead of addressing these impacts, the plan evades any meaningful analysis of these cumulative impacts and their effects on the covered species. Rather, there is an implicit and unsubstantiated assumption that the proposed default management measures are adequate to prevent detrimental cumulative watershed effects regardless of the current condition of any specific watershed. Moreover, no watershed analysis or analogous process is proposed to assess or establish limits on cumulative watershed effects where unacceptable impacts exist or would occur without more locally tailored management limitations. The plan inappropriately dismisses the impacts of current management on hydrology, peak flows and soils.

G10-17

+ **The Plan's stated objectives and the assessment of environmental effects are inappropriately founded on a highly managed, degraded environmental baseline.** For example, maintenance of the current distribution of amphibians, which reflects the virtual elimination of many species from historically occupied lowland sites, is considered acceptable in the plan without analysis or disclosure of the consequences of this assumption..

G10-18

+ **The Plan inadequately describes past management activities and current condition of watersheds within Simpson's holdings.** Noticeably absent for each watershed is a quantification of such parameters as road density, past timber harvest rates and methods, and riparian density and composition. Such parameters are essential for a meaningful description of the environmental baseline and its relationship to the recovery of Covered Species. Without such information it is impossible to adequately assess the effectiveness of proposed mitigation measures and the potential cumulative effects of Simpson's proposed 50-year work plan. Impacts on coho salmon in particular are inadequately assessed: in describing the plan area, the AHCP downplays the importance of Simpson's holdings in the Klamath Basin, stating that their properties comprise only 2% of the basin. However, Simpson presently owns over 80% of the Lower Klamath sub-basin

Response to Comment G10-19

See response to Comment G10-4.

Response to Comment G10-20

The Plan's goals and objectives (AHCP/CCAA Section 6.1) were developed to address the assumed biological impact which could potentially occur during Green Diamond's implementation of covered activities in the Plan Area. In addition, general "limiting factors" analyses were performed by Green Diamond to prioritize habitat conditions that may be preventing healthy, functioning aquatic/riparian ecosystems. One of the primary "limiting factors" in many HPAs (see AHCP/CCAA Table 7-1) was determined to be excessive sediment delivery to Plan Area watercourses. The Plan conservation measures were designed to address each of those limiting conditions in every HPA as though it were in fact a limiting factor in that HPA. See Master Response 3 specifically regarding the "limiting factors" analysis.

As described in AHCP/CCAA Section 6, in the HCP Handbook, and in the Final Addendum to the Handbook (65 FR 35251), biological goals provide broad, guiding principles for an HCP's operating conservation program and "the rationale behind the minimization and mitigation strategies." Biological objectives are more specific, include measurable parameters, and are the different components needed to achieve the biological goals. One of the biological goals of the Plan is to minimize human-caused sediment inputs (AHCP/CCAA Section 6.1.2.1). The biological objective for reducing sediment delivery into watercourses (AHCP/CCAA Section 6.1.2.2.4) complements this goal and is based on two measurable targets: (1) treatment of high or

G10-18

(excluding Federally owned portions of Blue Creek) which contains a major portion of the remaining coho salmon habitat in the Klamath Basin. The potential impacts of Simpson's commercial timber production in this basin on coho survival and recovery are highly significant.

G10-19

There is a general lack of quantitative supporting analysis regarding the expected level of management-related impact to covered species and their habitats, nor is there any associated analysis of how these impacts relate to the survival and recovery of these species. Absent such an assessment, there is no way to gauge the sufficiency of the proposed measures to achieve habitat protection and recovery. If the Services have conducted such an assessment, it should be presented with the DEIS as part of the rationale for proposing this decision. It should not be relegated to the role of post-hoc rationalization for a deal that has already been struck. The analysis provided is conclusory and its basis is not disclosed. The plan should include complete disclosure of what conceptual or numerical models were used to determine the direction and magnitude of impact on habitat conditions and species survival. The plan fails to identify and disclose the assumed mechanisms of biological impact and magnitude of effect, rendering the record opaque to scientific review and verification of these assumptions.

G10-20

The sediment delivery objectives and measures lack a biologically-relevant basis. The Plan's sediment delivery measures and supporting analysis are not tied to the habitat needs of covered species. Sediment delivery studies in Simpson Hydrographic Planning Areas should tie sediment delivery volumes and frequency to habitat degradation, stasis or improvement. Furthermore, discussing reduction in sediment delivery without discussing how habitat is affected in the streams to which the sediment is being delivered is not addressing what should be the main sediment issue in the AHCP. Forest management activity alters habitat of the affected species by changes in the magnitude, frequency, and spatial distribution of landslides and other erosion sources, not simply by changes in net volume delivered over time. These must all be addressed for credible projections of biological response to the proposed conservation measures.

G10-21

The appropriate objective for the slope stability measures is to prevent alteration of the natural landslide regime. Affected species have adapted to the periodic delivery of large volumes of coarse and fine sediment to stream channels as a consequence of slope failures produced by storms. It should be the goal of the AHCP to ensure that the volume of this periodic delivery is not further increased by management, and that the spatial distribution of landslide occurrence is not expanded. Therefore, management should avoid road building and harvest activities that demonstrably have contributed to large sediment deliveries during storms. These activities include major road construction on steep streamside slopes and road construction across headwater swales. In lieu of the specific analysis of biological consequences of landsliding described in the previous paragraph, this is a defensible approach to defining the conditions of biological recovery with some fairly high level of confidence. Any regime that departs substantially from the

moderate priority road sites to reduce the amount of road-related sediment at such sites by more than 46 percent within the first 15 years of the permits, and (2) achieve a 70 percent reduction in sediment delivery from management-related landslides in harvested steep streamside slopes compared to delivery volumes from clearcut reference areas. Possible effects of sediment delivery to Plan Area waters are discussed on an HPA-by-HPA basis in AHCP/CCAA Section 4.4. Further, the biological relevance of these targets is described in AHCP/CCAA Section 5.3, which describes the potential for increased sediment input including: (1) potential effects of covered activities, (2) sediment sources and erosion processes, (3) sediment transport processes, and (4) potential effects on covered species. The Plan's sediment delivery measures and supporting analysis are directly linked to the stated biological goals and objectives, and a reduction in sediment delivery would benefit the covered species.

The reduction in the net volume of sediment delivered over time is one of the desired effects of the Plan. Prescriptions to reduce sediment input have been set forth in AHCP/CCAA Section 6.2.1 (riparian measures), AHCP/CCAA Section 6.2.2 (slope stability measures), AHCP/CCAA Section 6.2.3 (road management measures), and AHCP/CCAA Section 6.2.4 (harvest-related ground disturbance measures). When the Operating Conservation Program as a whole, has been implemented in the Plan Area, the Services expect that its measures will result in an overall reduction in sediment delivery to Plan Area watercourses compared to the No Action Alternative.

Response to Comment G10-21

The riparian conservation (AHCP/CCAA Section 6.2.1) and harvest-related ground disturbance measures (AHCP/CCAA Section 6.2.4) described in the AHCP/CCAA are expected to work in concert with the Plan's slope stability measures to mitigate and reduce the volume of sediment delivered during storms. Specifically, slope stability measures include prescriptive measures to avoid impacts on steep streamside slopes (AHCP/CCAA Section 6.2.2.1), headwater swales (AHCP/CCAA Section 6.2.2.2), deep-seated landslides (AHCP/CCAA Section 6.2.2.3) and shallow rapid landslides (AHCP/CCAA Section 6.2.2.4) that may occur from implementation of the covered activities.

Response to Comment G10-22

See response to Comment G10-5.

Response to Comment G10-23

See response to Comment G10-50 and Master Response 18 regarding riparian management measures; response to Comment G9-2 and Master Response 6 regarding comparisons between Green Diamond's Plan and other HCPs, including the Pacific Lumber Company HCP; and Master Response 7 regarding the relationship between the Plan and the CFPRs. See also responses to Comments G10-24, G10-51 and R1-152, for example, regarding the selection of different or additional conservation measures.

Response to Comment G10-24

See response to Comment G10-49 regarding the Plan's biological objectives; responses to Comments G10-40 through G10-43 regarding the conservation of amphibians; and the response to Comment G10-50 and Master Response 18 regarding riparian management. Further, the selection of specific prescriptions, including whether to include a "no cut" buffer, is a matter of the Permit applicant's discretion (HCP Handbook at 3-19). The Services' role during the development of a conservation program is to *"be prepared to advise,"* and to judge its consistency with the ESA approval criteria once the application is complete (HCP Handbook at 3-6 and 3-7). The ESA does not require that any particular measure be adopted or imposed, but only that its criteria for Permit issuance be met. Issuance criteria have been discussed in EIS section 1.3, AHCP/CCAA Section 1.4.1 and Master Response 8. The Services believe, based on the analysis provided

G10-21

pre-management landslide pattern requires careful analysis and justification that are not in evidence in the draft plan.

G10-22

The Plan is not spatially explicit and therefore does not ensure protection of biological refugia critical to survival and recovery of the covered species. Without specific information about where activities will take place in space and time, analysis of impacts of activity conducted under the plan and the effects of conservation measures can be erroneous or misleading. Most of the covered fish and amphibian species exist in a highly patchy distribution, as a consequence of historic habitat deterioration or fragmentation and local population decline. This fragmentation has significant demographic consequences on species persistence that need to be accounted for in a formal analysis. It also has consequences for conservation needs: if conservation measures are not carefully targeted to protect and enhance remaining self-sustaining populations and the specific habitat refugia that sustain them, the species will likely be lost from the planning area.

G10-23

The riparian protection measures proposed in the proposed Plan could, in several key respects, actually provide less protection than the current rules in protecting and restoring depleted sources of conifer LWD in riparian areas. The SRP Report (Ligon et al. 1999) concludes that current rules regarding the harvest of riparian stands are insufficient in protecting current sources of recruitable redwood LWD and the growth of future recruitable LWD. Therefore, it seems that if the applicant desires an incidental take permit, then they should be proposing riparian standards well above the current rules, yet the proposed Plan will effectively lock in the status quo with only minor modifications. The riparian management measures identified in the Plan will not adequately rehabilitate riparian areas currently devoid of mature redwoods. Key large redwoods should be permanently dedicated to the stream – not potentially harvested at a date after the Plan expires. The California Forest Practice Rules have been seriously criticized for their inability to protect aquatic species by the very agencies now proposing to grant Simpson this permit, yet the Services are proposing federal assurances without significant improvements to these rules and, in some cases, weakening of the rules. For example, Simpson's riparian proposals would replace the existing requirement that the ten largest trees in riparian area be retained. *See* infra at Section V B. The Plan also appears to ignore recommendations made in the recent past by NMFS and/or FWS technical staff regarding forest management practices necessary for take avoidance and practices recommended in other recent HCPs on nearby lands. (NMFS 2000; Palco HCP 1998). For example, the Pacific Lumber plan prohibits harvest on mass-wasting areas, including headwall swales (Palco at 6.3.3.7) while Simpson allows it with limited restrictions. Cf. Simpson at 6.3.3.7. The Pacific Lumber HCP is also more restrictive with respect to wet-weather road use. Palco at 6.3.3.6.

G10-24

The plan does not set appropriate management objectives for riparian areas, given the needs of Covered Species. No clear vision for riparian zone recovery (e.g., late-successional stand composition) is offered. The proposed riparian protection standards

in the Plan and EIS, that the Plan meets ESA requirements. The Services will complete ESA section 7 intra-service formal consultations and document our findings regarding Permit issuance. See also responses to Comments G10-51 and R1-152, for example, regarding the selection of different or additional conservation measures.

Response to Comment G10-25

The selection of specific prescriptions, including whether they specifically protect Class III streams or headwall swales, was addressed in the Plan and the overall selection of measures was a matter of the Permit applicant's discretion. HCP Handbook at 3-19. The Services' role during the development of the conservation program is to *"be prepared to advise"* and to judge its consistency with the ESA approval criteria as a whole once the application is complete (HCP Handbook at 3-6 and 3-7). See Master Response 3 and the response to Comment G6-42. As noted above, the ESA does not require that any particular measure be adopted or imposed, but only that its criteria for Permit issuance be met. Issuance criteria are discussed in AHCP/CCAA Section 1.4.1, EIS Section 1.3 and Master Response 8. Also see responses to Comments G3-40, G10-41 and S5-95 for additional discussion of Class III streams and response to Comment G10-42 for additional discussion of headwall swales.

Response to Comment G10-26

As provided in AHCP/CCAA Section 6.3.5.4.3 and Master Response 16, the 70 percent effectiveness pertains to minimizing management-related sediment delivery from landslides compared to that from appropriate historical clear-cut reference areas, not road-related sediment. See AHCP/CCAA Section 6.2.3.5 specifically relating to construction of new roads. The Services expect that implementation of these and other measures included in the Operating Conservation Program would result in a reduction of new road construction in "problem areas." The Services agree with the commenter that not all road related erosion and

do not adequately emphasize the importance of creating late-successional streamside areas and retaining the largest trees. It is particularly important for amphibians to create and maintain interior or "core" areas of riparian forest where aquatic and near-stream conditions are suitable for cold-water adapted amphibians. Wide no-cut buffers of 30 meters or greater are necessary to provide the microclimate required by the adult life stages of several amphibians, including the tailed frog and southern torrent salamander. *See e.g.* Welsh et al. p. 67. The services own guidance has recommended protection within areas equivalent to a site-potential tree height. E.g. Spence 1996. Retention of larger size classes of conifers also is necessary to prevent the continuous selection and harvest of larger trees, allowed by this proposal. These largest existing trees are most likely to contribute large wood structure during the life of this plan. Such wood is necessary to create the structurally diverse habitats needed by the larval life stages of these species. Given the low levels at which most riparian areas currently function, only management actions that do not impede or accelerate riparian recovery should be permitted.

G10-24

+ **There is inadequate protection of Class III streams and headwall swales.** Actions in the headwaters will propagate their effects downstream. There is a complete lack of analysis regarding foreseeable changes in the sediment regimes that are likely to accrue to public natural resources off of Simpson's ownership.. Headwater systems provide the link between terrestrial processes and fish bearing streams (Gomi et al. 2002). Employing the River Continuum Concept (Vannote et al. 1980) to riparian protection measures would result in the greatest protection occurring in headwater zones (Noss et al 2000). Protection of headwater areas is especially important in meeting the needs of amphibian species Although the Plan extends Class II watercourse protection measures to seeps, springs, wet meadows, and wet areas, recognizing the importance of these aquatic features to the aquatic ecosystem, there still exists a lack of protection for headwall swales. Headwall swales are often the source of unchannelized aquatic features (seeps, springs, wet areas) and serve as initiation points for slides delivering sediment to watercourses. They are also sources of nutrients and habitat structure for receiving waters. Headwater systems provide the link between terrestrial processes and fish bearing streams (Gomi et al. 2002). Employing the River Continuum Concept (Vannote et al. 1980) to riparian protection measures would result in the greatest protection occurring in headwater zones (Noss et al. 2000). Because Class III streams are vectors for transferring sediment and water to downstream aquatic habitat, and they are a primary direct erosion source in the affected watersheds, vegetation along these stream courses and woody debris within them are crucial to mediating their role in sustaining downstream habitat. A plan that fails to afford specific protection to Class III streams in this landscape is not likely to be effective.

G10-25

G10-26 + **New roads are not adequately prevented in problem locations**. The panel identifies several key concerns with the assumptions and analysis regarding the roads provisions. First, there is an assumption that the reduction of road-related sediment by 70% from current levels is adequate to avoid road-related jeopardy to the covered species. However,

subsequent sediment delivery to streams will be, or can be, eliminated. The net amount of sediment input to Plan Area watercourses and thereby the covered species' habitats, is anticipated to be less than under the No Action Alternative. See also the response to Comment G10-52 regarding the road management measures.

Response to Comment G10-27

The Services believe that the rapid response measures (AHCP/CCAA Section 6.2.5.1) are appropriate. See response to Comment G10-10.

Response to Comment G10-28

Plan approval and issuance of the Permits would supplement Green Diamond's existing obligation to comply with otherwise applicable laws, including Federal and State water quality laws. With or without the Plan and Permits, Green Diamond would continue to be subject to water quality laws, and the Plan does acknowledge water quality issues. See, for example, AHCP/CCAA Section 4.3.6 regarding the status of some Plan Area watercourses as water quality impaired. See also the responses to Comments R1-27, S5-1 and S5-48, among others, regarding the applicability of water quality laws in the Plan Area; the response to Comments G10-35 through G10-38 regarding suspended sediment and turbidity; and Master Response 4 regarding herbicide use.

Response to Comment G10-29

Comments regarding herbicide use in the Plan Area have been addressed in Master Response 4.

there is no ecological basis for this objective, as 70% is tied neither to the natural regime nor to the needs of the covered species. A second set of concerns addresses the extent to which reduction or prevention of road related sediment production though stormproofing actually is capable of offsetting the large amounts of sediment produced from silviculturally related landslides. *See* infra at V.D.2. Therefore, given the uncertainties about the potential to mitigate for landscape-level alterations of the sediment and hydrological regimes through road upgrades, it would be prudent for this plan to avoid making the situation worse through new roadbuilding, particularly in steep and riparian locations. Although roads are prohibited from draining "directly" into watercourses, however, the road location standards still will allow new roadbuilding in riparian areas and on landslide-prone-locations. Though perhaps possible in theory, in a practical sense it is widely recognized as infeasible to construct stable roads that do not drain or deposit sediment into watercourses in these most sensitive portions of the landscape

G10-26

+ **Monitoring and adaptive management measures lack mechanisms capable of detecting and implementing limits on cumulative effects**. Suspended sediment, not temperature, would best serve as a rapid response indicator. *See* infra at III.B. Fish response thresholds are absent, and amphibian response mechanisms are flawed. *See* Sections IV and V.D.

G10-27

+ **There is virtually no analysis regarding the relationship of this plan to attainment of water quality standards for parameters other than temperature.** Best available data on turbidity, for example, should be brought to bear. Consideration should be given to watershed-specific practices in areas not currently meeting standards for forestry-related parameters.

G10-28

+ **Herbicide impacts are not addressed, although their use is associated with the activities covered in the Plan.** The proposed Plan fails to make any substantive findings about the potential impacts of herbicides on water quality and listed aquatic species. These impacts should be addressed regardless of the fact that Simpson is not seeking coverage of their use. AHCP v.1, 2-9 (Section 2.4.3. Control of Competing Vegetation). Based on the substantial literature available regarding how the application of herbicides may affect aquatic species, the Plan could and should have included the steps they (or their sub-contractors) would follow to minimize the accidental introduction of substances commonly used in commercial timber management; such as Atrazine; Triclopyr; Garlon 3 and 4; 2,4-D; and Glyphosate into Plan Area streams. Section 2, Description of Simpson's Timber Operations and Forest Management Activities, should include a description of annual, repeated use of herbicides over several thousand acres of forest lands that drain into waterways that support listed species and are utilized by the public, yet this analysis is omitted. The potential impacts of Simpson's proposed activities or the effectiveness of proposed mitigation measures cannot be evaluated without the information necessary to understand all interrelated portions of their timber management activities.

G10-29

Response to Comment G10-30

Comments regarding the determination of "likely to recruit" are addressed in Master Response 5.

The definition for watercourse transition line provided in the Plan is not an unspecified protocol. The definition predates the Threatened and Impaired Watershed Rules package of the CFPRs by over ten years and was used by CDF and RPFs to successfully implement forest practices for riparian protection. The slope class refers to a slope's gradient that would be compared with the Plan's conservation requirements to qualify for steep streamside slope or other RMZ conservation measures.

Response to Comment G10-31

See response to Comment G10-14.

Response to Comment G10-32

Comments regarding cumulative watershed effects have been addressed in Master Response 3 and the response to Comment G6-42. Further, as indicated in AHCP/CCAA Section 1.4, the Plan provides an additional layer of regulation - a level of regulation in addition to the requirements imposed by applicable laws and regulations including, among others, the Federal ESA, Federal CWA, the California Public Resources Code (including the CFPRs), and the California Fish and Game Code (including the State ESA). Background conditions have been discussed in Master Response 1 and the Plan's monitoring and adaptive management processes have been discussed in Master Response 11.

G10-30

- **Key provisions of the Plan rely on extremely subjective, discretionary provisions that, while they may be given ecologically appropriate meaning by some current technical staff at Simpson, may not be given consistent meaning by future managers.** Key provisions regarding retention of riparian trees dependent on a subjective determination of "likely to recruit". The delineation of riparian areas depends on an unspecified protocol for determining watercourse transition lines, and a key factor for determining riparian protection – slope class – has no associated clear definition.

G10-31

- **There is little or no supporting analysis provided to indicate how this decision meets the applicable decision standards.** The public review package addresses matters of NEPA compliance but short-shrifts analysis of the applicable decision standards. Because approval of this plan will have the effect of insulating the applicant, Simpson, from new regulatory requirements over the next 50 years, this decision must be based on a solid scientific rationale that justifies placing the public trust in this plan versus the evolutionary process to which the CFPRs are clearly subject. This decision deserves more carefully scrutiny for its ecological consequences. We suggest that it would have been appropriate to include at least a draft biological opinion in the review package.

III. CUMULATIVE WATERSHED EFFECTS

G10-32

A habitat conservation plan should reserve and/or restore significantly more and better quality habitat than is anticipated under existing and future regulatory authority. Otherwise, it is not advantageous from a public resource perspective to strike a long-term deal with private landowners and forego the possibility that the baseline rules for protecting protected species will likely improve beyond the protection afforded in the HCP. From an ecological and anadromous salmonid fishery perspective, the greatest deficiency of the California Forest Practice Rules (CFPRs) and its implementation continues to their failure to actively prevent significant cumulative watershed effects (CWEs). This was the conclusion (Ligon et al. 1999) of the Scientific Review Panel (SRP), an independent panel of scientists created by the March 1998 Memorandum of Agreement between the National Marine Fisheries Service (NMFS) and The Resources Agency of California that comprehensively reviewed whether the CFPRs adequately protected anadromous salmonid species in Northern California. Simpson's proposal, however, fails to demonstrate how CWEs will be reduced to a level that meets the needs of covered species throughout their ownership over a projected timeline. In order for this Plan to compensate the existing rules' greatest deficiency, the plan should be fundamentally based on establishing reasonable background conditions (i.e., quantitative objectives), assessing present CWEs, devising a management strategy to mitigate and prevent CWEs, and monitoring performance to encourage timely adaptive management.

G10-33

Simpson believes (Section 5) that following the AHCP's actions will provide an incremental "positive" effect on the listed species and will not cause or contribute to negative cummulative effects. Where is the evidence or proof of this claim if there is no cummulative effects analysis provided? The plain fails to provide even rudimentary background information on the harvest history for each watershed, specifically: harvest and road building methods, timing, amounts,

Response to Comment G10-33

Comments regarding cumulative effects are addressed in AHCP/CCAA Sections 5.7 and 7, and in Master Response 3. Regarding rate of harvest, see Master Response 11. Watershed conditions were summarized on an HPA-by-HPA basis in AHCP/CCAA Section 4.4. Regarding loss of fry, as described in the limiting factor discussion in Master Response 3, only a reduction in the life history stage of a covered species ultimately would affect the population. For example, a reduction, within limits, in the number of fry emerging from the spawning gravels would not affect the population if the limiting factor (bottleneck) was summer rearing habitat for the juveniles. (See AHCP/CCAA Section 5.7.)

Response to Comment G10-34

Comments regarding cumulative effects, including issues associated with the rate of harvest, are addressed in AHCP/CCAA Section 5.7 and 7, and in Master Response 3. Rate of harvest also is discussed in Master Response 11. The Plan does not rely on an assumption that "best management practices prevent cumulative watershed effects from occurring or limit them to insignificance." This statement does not reflect the premises of the cumulative impacts assessment in the Plan or the EIS. The analysis in the Plan and the EIS is an analysis of the cumulative impacts of the Services' approval of the Permits, including implementation of the Plan.

Regarding the assertion that management of cumulative effects should be integrated throughout the Plan "to achieve biological goals," the Services note that, as discussed in Master Response 12, the role of biological goals and objectives in a prescription-based plan like Green Diamond's is different than their role in a results-based plan. In a prescription-based plan, the biological goals and objectives guide development of specific measures that are included in the operating conservation program; they are not themselves standards that must be "achieved."

and rates of harvest. These past activities not only contributed to the current state of the plan area, but will also influence the rate of recovery when combined with Simpson's current management and the proposed mitigations in Section 6. Simpson's assessment of the limiting factors impacting juvenile salmonids in the Plan Area watersheds seems on target – mainly reductions of summer and winter habitat as related to excess sediment and a lack of inchannel LWD and a lack of recruitable LWD within riparian areas. However, a previous statement that it might be acceptable to reduce the survival of the coho egg and fry production by 50% and have no negative effect on the species as a whole, is highly speculative, is unsupported by any evidence, and, in fact, quite likely wrong. High turbidities can stress or kill a large portion of those fry that do manage to survive and emerge from the stream bed. Furthermore, much of the "surplus" coho fry is probably an important forage item for older age-classes of juvenile salmonids, as well as birds and other aquatic/riparian wildlife. Also, the same physical impacts that harm incubating eggs and newly emerged fry also contribute to a paucity of summer and winter habitat – that is, accelerated slope and channel erosion causes excess sediment input (coarse and fine), leading to high percentage of fines in spawning gravels, as well as filling-in pool habitat. (Hagans and Weaver 1986; Lisle 1982; Lisle and Hilton 1992; Frissell 1992; Frissell et. al. 1997 and numerous others).

G10-33

A. Ongoing and Potential CWEs Not Integral Component of the AHCP

G10-34

The Simpson AHCP focuses harvest prescription, adaptive management, and proposed monitoring on how an acre can be better harvested (including road management), and not on how many acres can be safely harvested to prevent significant cumulative watershed effects. Take the North Fork Mad River as an example where considerable harvesting can be observed from Rt. 299. As more of this watershed is harvested, how does the Simpson plan determine no significant cumulative watershed effects are occurring? Observing the North Fork Mad River mainstem from Korbel Bridge last winter, the extremely high turbidity indicates significant cumulative impacts already are occurring. (B. Trush personal observations).

Management of cumulative effects must be integrated throughout the Plan to achieve biological goals (Section 6.1.1, pp. 6-1& 6-2). However, this proposed AHCP carefully avoids specifically addressing either present or future CWEs. For example, habitat typing surveys in streams revealed low large woody debris (LWD) levels. Yet the only human factors attributed to this current habitat condition were past harvest practices and stream cleaning – inexplicably, no effect is attributed to current harvest practices. In Section 6.2.6.2 (p. 6-57), the rate-of-harvest is not even considered an option for monitoring and adaptive management. Simpson relies on the assumption (a doctrine for CDF) that best management practices prevent cumulative watershed effects from occurring or limit them to insignificance. Common sense dictates otherwise. No matter how good a management prescription might be, even if improved over practices in the current CFPRs, no management prescription is foolproof. Sediment, particularly fine sediment, will be produced and will enter a drainage network under the best intentions. The more surface area cumulatively exposed (as with harvest surface area and road surfaces of all kinds), the more cumulative sediment enters streams thus elevating the risk of significant CWEs. An HCP must

Response to Comment G10-35

See Master Response 3. The ESA does not require implementation of the Plan to actually result in "biological recovery" (see Master Response 8). The Services' conclusions do not rely on any specified rate of harvesting. The mitigation furnished by the applicant is tied to its operation rates such that an increase would result in a concomitant increase in mitigation. Rate of harvest has been discussed in Master Response 11.

Response to Comment G10-36

See Master Response 3.

G10-34 be capable of detecting and then preventing cumulative exposure from timber harvest operations that is, or can be, too great. The Simpson AHCP does not have this capability.

B. Suspended Sediment and Turbidity Should be Primary Measures of CWEs

G10-35 Suspended sediment is a highly responsive measurement variable collectively relating timber operations from many harvest units to CWEs and, ultimately beneficial uses (Reid no date). Although the Simpson plan may seem to exhaustively address sediment impacts, a close review reveals otherwise. The Plan only enlists suspended sediment as a tool to develop better prescriptions for how a segment of road can be better managed (Section 6.2.5.2.2, p.6-49). But suspended sediment is perhaps the best indicator for measuring how well present and future harvest operations in an entire HPA are performing collectively, such as throughout the North Fork Mad River watershed. If best management practices have been doing their job at preventing significant CWEs (an implicit assumption in the HCP), then a turbidity monitoring station under Korbel Bridge would reveal suspended sediment concentrations within state water quality standards administered by the North Coast Regional Water Quality Control Board. If these standards are being exceeded (visual inspection by B. Trush last winter clearly indicates exceedence), then turbidity monitoring will document future watershed level trends where cumulative suspended sediment effects are most likely to be expressed.

We agree that the Plan might reduce sediment delivery relative to current levels (unless the rate-of-harvest is increased) but this does not ensure that biological recovery will occur, nor does it free the Plan from addressing CWEs, ongoing and future. The Simpson proposal supplies incomplete information on the contemporary harvest rate (last 10-yr rate) and proposed future rate in specific watersheds. With a higher rate-of-harvest – which could occur under the Plan, future sediment delivery could increase over present delivery, even with improved harvest and road management prescriptions. Moreover, extensive habitat impairment could continue or worsen as a consequence of the accumulated effect of new sediment exacerbating existing sediment levels. This is in fact the situation in other watersheds adversely affected by sediment input from logging over time (e.g., Frissell et al. 1997, Frissell 1992, Platts et al. 1989, Hagans et al. 1986, and many more).

C. Rapid Response Monitoring is Not Part of the Plan

G10-36 Long-term monitoring of spawning habitat permeability and channel morphology is the only method proposed to quantify sediment-related effects and evaluate whether present sediment delivery is cumulative, biologically significant harm. However, rapid response monitoring to head-off cumulative sediment-related impacts at the watershed scale is conspicuously missing. In fact, the AHCP does not recognize sediment-related CWEs as a future issue. Appendix F (p. F-4) states:

> The sediment model does not address cumulative watershed effects (CWEs). It is not site specific, and it does not integrate past, current, and reasonably foreseeable projects. Instead, the sediment

Response to Comment G10-37

See Master Response 3. The Plan's monitoring program is designed to monitor progress on these areas (see AHCP/CCAA Sections 6.2.5, 6.2.7, 6.3.5 and 6.3.7, and AHCP/CCAA Appendices C and D).

Response to Comment G10-38

Green Diamond is required to include the continuous turbidity monitoring approach in the conservation measures, specifically within the four experimental watersheds (See AHCP/CCAA Section 6.2.5.1.4, as further described in Section 6.3.5.2.4). A Permit applicant is not required to include every "feasible" monitoring method within its plan, as long as there are appropriate, adequate and effective monitoring methods proposed in the plan. Similarly, the ESA does not require that the Services require Green Diamond to provide a rationale for rejecting (or selecting) one monitoring method over another but rather to judge the adequacy of the Plan overall in light of the Section 10 approval criteria. See Master Response 8.

model is spatially- averaged over the Simpson ownership with the 11 HPAs and time-averaged over the next 50 years. This does not reflect actual sediment delivery processes, which are prone to occur in more of an episodic nature and vary locally, depending mostly on climatic conditions. However, the significance of this limitation is reduced by the adaptive management mechanisms in the Plan that are expected to provide appropriate elasticity for the conservation measures within individual HPAs to meet the needs of the aquatic resources of concern.

G10-36

Thus, sediment-related cumulative effects are dealt with by simply stating that the habitat needs are being met by the proposed "conservation measures." This philosophy parallels CDF's checking the box for whether CWEs are, or are not, occurring in a given THP. Given all the model's qualifiers (see Appendix F, p. F-4), how will we know if the predictions of the sediment model are reasonable, and future sediment reductions biologically significant, if the plan does not propose monitoring at the watershed scale of the HPA? Chronic turbidity at baseflows is not episodic and can be effectively modeled to relate surface erosion (from harvest area and roads) to the rate-of harvest (including road management) and, ultimately, to beneficial uses.

G10-37

The Plan's experimental watershed program also fails to address CWE monitoring. Given the harvest activity in the North Fork Mad River, this watershed should be a prime candidate for the program to assess potential and ongoing cumulative effects. Within the four experimental watersheds that were selected, suspended sediment will be monitored -- but only in Class III tributaries (Section 6.2.5.2.2, p.6-49) to determine the amount of sediment delivered from Class III watercourses following timber harvest and above and below Class II-1 and II-2 watercourse crossings. Section 6.2.5.1.4 (p.6-49) notes there will be one permanent continuous monitoring station in each experimental watershed. Presumably these four monitoring stations will be in the Class III tributaries only. Section 6.2.5.4, p.6-51) cites: "Effectiveness monitoring projects and programs that due to their complexity and expense of implementation can only be applied in limited regions (these include turbidity monitoring, Class III sediment monitoring, and road related mass wasting monitoring)." Monitoring suspended sediment and turbidity where CWEs are most likely to occur, i.e. farther down in the watershed, again is conspicuously missing.

G10-38

We do not expect a private timber company to become a private research institute as well, but turbidity monitoring to document HPA performance is highly feasible. A few active parents have established a continuous turbidity monitoring station on Jacoby Creek for Jacoby Elementary School. In the lower mainstem of Little River, an ongoing gauging station could readily be fitted to continuously monitor turbidity. Simpson provides no acceptable rationale for discounting turbidity monitoring at downstream locations (i.e., not limited to the headwaters) within HPA watersheds undergoing high harvest activity, whether deemed experimental or not. Measurement of turbidity is not simply an experimental tool for refining harvest prescriptions as adopted in the Plan. It is a practical, rapid-response approach to measuring and documenting CWEs resulting from ongoing and future land use practices. In fact, the North Coast Regional Water Quality Control Board is requiring turbidity monitoring under its regulatory authority in

Response to Comment G10-39

Comment noted. By way of clarification, however, the Permit applicant is not requesting a 50-year exemption from the ESA; instead, the application seeks authorization of take which is limited by the Plan, Permits and IA, from the ESA Section 9 take prohibition for the covered species in the Plan Area. In any event, the Services' enforcement mechanisms are available, and the integrity of personnel does not play a role in Permit approval.

Response to Comment G10-40

An early warning signal of potential increases of stream temperature employs a "yellow light" temperature threshold based on watershed acreage. See AHCP/CCAA Section 6.2.5.5.1. These thresholds would be potentially more protective of sub-lethal habitat conditions and the actual temperatures representing the "yellow light" thresholds are at lower temperature values than those for the "red light" thresholds. As stated in AHCP/CCAA Section 4.3, exceedance of this "yellow light" threshold will result in an internal audit by Green Diamond to determine causes and management actions that may be necessary to correct these temperatures if practicable. As such, these early warning reviews would occur prior to any "red light" or upper limit temperature threshold is reached. If an increase in temperature occurs, the acreage weighted "red light" threshold criterion would then precipitate a joint review by Green Diamond and the Services to determine causes and management actions. See AHCP/CCAA Section 6.2.6.1.2. These would be taken to rectify excessive water temperatures which may be deleterious to aquatic life.

Also, as discussed in AHCP/CCAA Section 6.2.5.5, a maximum

G10-38 other Humboldt County watersheds currently developing Habitat Conservation Plans (California North Coast Regional Quality Control Board 2000).

IV. ISSUES RELATED TO CONSERVATION OF AMPHIBIANS

Both Covered Species of amphibians in the Plan are considered California State Species of Special Concern (Jennings and Hayes 1994) and the proposed activities could adversely impact their persistence and/or recovery in the Plan area. Key concerns with the Plan as it relates to the covered amphibians are discussed below.

A. Time Frame

G10-39 Time frame is a serious concern. The Plan requests a fifty-year exemption from the Endangered Species Act. We have learned a great deal about forest ecosystems and management over the last fifty years and it is reasonable to expect we will learn much more in the next. Adaptive management and biological thresholds may help adjust the Plan as the state of knowledge increases, but much of the interpretation and implementation depends on the people administering the Plan. Even given full confidence in the integrity of the current amphibian biologists at Simpson Resource Company, it is impossible to predict how the program will develop as personnel changes over the decades.

B. Temperature

G10-40 The covered amphibians are considered cold-adapted species (Simpson AHCP, v.1, S-6, Brattstrom 1963, Nussbaum et al. 1983). Increases in temperature following timber harvest have been implicated in population declines at some sites (Welsh 1990, 1993, Welsh and Lind 1991, 1996). Temperature is especially important for inland populations, but may be less a factor for the covered species in cooler coastal forests (Ashton 2002). Over the next fifty years, the threat of global warming may the increase the importance of thermal buffers for cold-adapted species in both aquatic and terrestrial habitats.

Simpson's use of water temperature as a monitoring threshold to trigger an adaptive management response gives rise to two concerns.

First, biological threshold temperatures are upper limits for survival, but thermal stress can result from prolonged exposed to sub-threshold levels. Long term persistence at near threshold temperatures has not been investigated in the wild. Reported thermal threshold for larva of these species is based primarily on laboratory work (Brattstorm 1963).

A second major concern is the use of a 7-day moving average temperature (7DMAVG) as the monitoring threshold. Using the average temperature can mask peak temperatures. This masking would be expected to be greatest in streams with the highest temperature fluctuations. Averaging nighttime low temperatures with daytime high temperatures lowers the average, allowing maximum water temperature to climb above threshold levels without triggering an

threshold of 17.4°C will be set as an absolute or upper “red light” temperature threshold. It must be pointed out that the area-weighted temperature thresholds described and shown in AHCP/CCAA Section 6.2.5.5.1 were derived from monitoring data collected from locations presently occupied by populations of the two amphibian species and coho salmon. Based on the use of both the “yellow” and “red light” triggering thresholds, temperature monitoring in the future will protect those species from both lethal and sublethal temperatures. These triggers will protect the covered species from both sub-lethal effects (e.g., “thermal stress” or reproductive effects) and lethal effects (mortality) from elevated water temperatures.

As stated above and in AHCP/CCAA Section 4.4.1.1, of the 400 Class I temperature profiles developed within the Plan Area since 1994, 93.8 percent were at or below the 17.4°C threshold. This threshold (MWAT) was developed from the NMFS’ (1997) *Aquatic Properly Functioning Condition Matrix*. However, the MWAT threshold of 17.4°C failed to account for natural variation in water temperatures due to geology, climate, and drainage area. As such, the MWAT was not selected as the most protective and appropriate metric for measuring water temperature effects on aquatic life. As stated in AHCP/CCAA Section 5.5.2, for water temperatures less than lethal, the impacts of elevated temperature to aquatic life tends to be cumulative and therefore short-term increases, as measured by the absolute maximum temperature, are less likely to be harmful than chronic, long-term increases as measured by the 7DMAVG temperature. Therefore, as described in the Plan, “red and yellow light” threshold criteria were developed to adequately monitor and provide protection to covered species from both lethal and sub-lethal water temperatures.

Response to Comment G10-41

It is true that sediment generated from Class III streams has the greatest impact on the covered amphibians that occur primarily in Class II streams. However, monitoring of sediment is focused on Class III streams because it is most easily quantified in these stream reaches. Headwater Class II streams tend to be transport reaches that often do not show the impact of increased sediment inputs except in the low gradient reaches. These low-gradient reaches of Class II streams generally contain high levels of fine sediments deposited from harvesting activities that occurred in the past together with natural accumulations. As a result, headwater Class II streams may show little change in sediment composition even when the sediment supply is changing. To avoid this circumstance, sediment monitoring in the Plan intentionally focuses on the Class III reaches in which sediment can be monitored and quantified more easily using changes in channel morphology. In those stream reaches, the processes of down cutting, head cutting, sediment formation, and suspended sediment can be measured. For a discussion of the monitoring protocol, see Appendix D2.3 of the Plan.

Response to Comment G10-42

The Plan acknowledges the importance of headwater reaches and provides conservation measures for protection of those areas, including Class II protection to headwater seeps, springs, and wet areas where they define habitat for the covered species, Class III protections to maintain riparian function (AHCP/CCAA Section 6.2.1.5), measures for steep streamside slopes (AHCP/CCAA Section 6.2.2.1), and measures specifically for headwall swales

adaptive response. If the goal is to protect the covered species from exposure to excessive temperatures, it may be more appropriate to use a 7-day moving maximum (7DMMX) as an adaptive management trigger. The Plan proposes to document the 7MMX but only appears to use the 7DMAVG as a threshold trigger (AHCP v2 D-5). G10-40

C. Sediment

Fine sediment in streams may be the single most important habitat characteristic affecting the covered amphibian species in the Plan Area. The Plan admits that increased sediment in streams has "the greatest potential to limit habitat and deter beneficial conservation efforts."(AHCP v1 S-9). Fine sediments fill the interstitial spaces in the stream substrate, reducing habitat availability for lotic amphibian larva and invertebrates. Smaller, lower gradient streams may be especially vulnerable to sedimentation because they often lack sufficient flow to flush sediments through the system (Ziemer 1998). This is why some studies on commercial timberland have shown lotic amphibian densities to be positively correlated with stream gradient (Diller and Wallace 1996, 1999). In the Plan, threshold monitoring for sediment is limited to Class III streams, but increased sedimentation may have the greatest impact on amphibians in Class II streams. It appears substrate conditions will be measured in conjunction with amphibian surveys, but sediment load does not appear to be part of the adaptive response for Class II streams. G10-41

D. River Continuum Concept

The Plan extends Class II watercourse protection measures to seeps, springs, wet meadows, and wet areas. Recognizing the importance of these aquatic features to the aquatic ecosystem is a step in the right direction, but there still exists a lack of protection for headwall swales. Headwall swales are often the source of unchannelized aquatic features (seeps, springs, wet areas) and serve as initiation points for slides delivering sediment to watercourses. They are also sources of nutrients and habitat structure for receiving waters. Headwater systems provide the link between terrestrial processes and fish bearing streams (Gomi et al. 2002). Employing the River Continuum Concept (Vannote et al. 1980) to riparian protection measures would result in the greatest protection occurring in headwater zones (Noss et al. 2000). G10-42

E. Upslope Harvest Activities

Aquatic habitat does not exist in isolation from the surrounding terrestrial landscape, so an AHCP that ignores upland forest management practices, fails to realistically assess the threat to, and response of, the aquatic system. The effectiveness of riparian buffers at controlling microclimate and sediment is strongly influenced by upslope land use. (Chen et al. 1993). Treating the AHCP as independent from upslope practices ignores the connection between riparian processes and upland forests (Gomi et al. 2002). G10-43

We are not able to assess the impact of herbicide use on aquatic systems because the Plan fails to acknowledge use of herbicides in upslope areas, which are not technically covered in the AHCP, but nonetheless may drain to receiving waters.

(AHCP/CCAA Section 6.2.2.2). The selection of specific prescriptions, including protection measures for Class II streams, is a matter of the Permit applicant's discretion (HCP Handbook at 3-19). The Services' role during the development of a conservation program is to *"be prepared to advise,"* and to judge its consistency with the ESA approval criteria once the application is complete (HCP Handbook at 3-6 and 3-7). The ESA does not require that any particular measure be adopted or imposed, but only that its criteria for Permit issuance be met. Issuance criteria have been discussed in EIS section 1.3, AHCP/CCAA Section 1.4.1 and Master Response 8.

Response to Comment G10-43

The Plan assesses upslope conditions as they relate to potential impacts on the covered species. The Plan evaluated conditions on an HPA-by-HPA basis (AHCP/CCAA Section 4.4) and analyzed potential impacts on the covered species in AHCP/CCAA Sections 5 and 7, including potential impacts from upslope activities. The impacts identified were those with the greatest likelihood to occur. The geographic scope of analysis conducted for the Plan has been discussed in Master Response 3. Herbicide use has been addressed in Master Response 4.

Response to Comment G10-44

Comment noted. The Operating Conservation Program places the highest emphasis on reducing significant sediment inputs, and, through its accelerated road management plan (AHCP/CCAA Section 6.2.6.2.3.2.1), the Plan has placed a particular focus on treating high and moderate priority sites that are potential sources of sediment to streams. Implementation of the Operating Conservation Program is expected to reduce the risk that such sites will fail and deliver significant sediment to Plan Area streams. In this way, the Plan is expected to reduce sediment delivery. This risk of sediment delivery from roads can be reduced by decommissioning or upgrading (see AHCP/CCAA Sections 6.2.3.3 and 6.2.3.4). By following the Plan's system for prioritizing treatment of sites, the Plan would reduce sediment delivery from the highest priority sites in an accelerated fashion regardless of whether the treatment of a particular road site is decommissioning or upgrading. The commenter is correct in that roads in the Plan Area are expected to have little traffic on them during rainy nights when the amphibians are moving. Accordingly, the Services do not expect significant direct impacts on the covered species from traffic.

Response to Comment G10-45

The potential negative effects of water drafting on the covered amphibians was given consideration in the development of the Plan and measures were included in the Operating Conservation Program that are expected to minimize such effects (see AHCP/CCAA Section 6.2.1.13, as further described in AHCP/CCAA Section 6.3.3.11).

F. Forest Roads

G10-44

Forest roads have been shown to negatively impact amphibian populations by direct mortality and habitat alteration. (Trombulak and Frissell 2000 provide a review of these and other impacts of roads). It is reasonable to expect that logging roads in the Plan Area receive little traffic during peak amphibian activity periods (raining nights) so direct mortality (roadkill) may not be a significant concern. Alteration of habitat is a larger concern in the Plan Area. Forest roads can increase sediment delivery to watercourses by increasing surface runoff and initiating slope failure (Best et al. 1995, Madej 2001). Forest roads also fragment forest habitat and can serve as a barrier to movement for a variety of vertebrates and invertebrates (*see* deMaynadier and Hunter 1995 *for a review*).

G. Water Drafting

G10-45

Airborne dust from haul roads is a not considered as a significant source of fine sediment to the aquatic system (L. Reid pers. comm.), but efforts to reduce airborne dust may impact amphibians. The proposed method of airborne dust reduction is road watering using water drafted from nearby sources, such as streams, springs and ponds. Water drafting may impact amphibian populations by changing stream level and flow rate above and below the drafting point. The Simpson AHCP states that larvae of the covered amphibian species are aquatic obligates (AHCP v1 S-6, Nussbaum et al. 1983), but then goes to suggest that "under certain circumstances, both can *persist* with temporary periods of subsurface flow during late summer and early fall". Does *persist* apply to the population or the individual? Is water drafting one of those circumstances where they are expected to persist? Is rate duration of water drafting consistent with natural processes? Will aquatic larvae be trapped in dewatered edgewater refugia during water drafting?

H. Monitoring

G10-46

Amphibians can serve as sensitive bioindicators of stream condition (Welsh and Ollivier 1998). Simpson proposes to use tailed frog and southern torrent salamander sub-populations as primary indicators of habitat condition in headwater streams. The AHCP states they have documented "the apparent extinction and recolonization of several torrent salamander sites" (Simpson AHCP v2 d-33). In our review we were unable to locate in the record a description of the procedure used to document the extinctions. Extinction of sub-populations is used as a monitoring threshold for southern torrent salamanders, but documenting extinction is highly sensitive to sampling method and net sampling effort, so it is critical to state the protocol for confirming extinction. Simpson proposes to monitor physical conditions in the stream in conjunction with amphibian sampling, but threshold values for important habitat characteristics of Class II streams are not used as adaptive management triggers. Water temperature and fine sediment load are probably the most important environmental factors for the covered species. Temperature (Heyer et al. 1994) and fine sediment load (Lisle and Hilton 1992) can be easily monitored and it is suggested that these parameters (in addition to bioindicators) should be used in an adaptive

Response to Comment G10-46

It is true that determining absence of a species is practically impossible, so that apparent extinctions may give false negative indications. However, this outcome means that the monitoring trigger is more conservative, or in other words, more likely to trigger adaptive management than is necessarily warranted. In addition, the monitoring was not focused on the habitat in headwater streams for the same reason described previously in response to Comment G10-41. The Services further note that headwater amphibian monitoring should not be considered in isolation, but in the context of all the other monitoring actions that will be concurrently taking place (see AHCP/CCAA Section 6.2.5).

Under the Proposed Alternative, triggering of a yellow light will result in notification to the Services within 30 days after Green Diamond's internal assessment indicates that yellow light threshold has been exceeded, and the Services and Green Diamond will work together to determine the cause of the exceedance and to determine any and all management changes necessary to address the situation. Within the limit of the AMRA (see Master Response 15), all necessary measures will be taken to address the issue. The Services believe that this collaborative approach to responding will benefit the covered species and their habitats in the Plan Area.

Response to Comment G10-47

Comments relating to the Scientific Review Panel are noted. The scientific review panel is discussed in AHCP/CCAA Section 6.2.6.1.2, regarding red light threshold triggers, and section 6.2.6.1.3 regarding SSS triggers. The AMRA, including the opening balance and how it may change, and how it would be used under the Plan are described in AHCP/CCAA Sections 6.2.6.3 and 6.3.6.2, as well as in Master Response 15. The Services believe this approach will provide sufficient independence to address the issues that may be directed to the Scientific Review Panel and that the AMRA is adequate for the purposes provided in the Plan.

Response to Comment G10-48

Regarding selection of control sites, Green Diamond sought to locate relatively undisturbed sites, including pristine sites on adjacent Federal or State park land. Given the possible control sites that are available, the Services believe that the BACI experimental design is the best possible monitoring tool to detect a significant treatment effect. The objective of the study is to determine if current timber operations have any effect on populations of the covered amphibians. Even if the control populations were declining, which the Services understand is unlikely based on the monitoring results in the Plan, they still could be used effectively as experimental controls. The criteria necessary for a site to be used as a control are that the site not have any treatment effects while having similar environmental covariates or nuisance variables (e.g. aspect, elevation, geology, climate, etc.) as the treatment site.

management plan. Changes in these important habitat conditions may be detected prior to any statistically significant response in amphibian populations. If channel conditions degrade, do we really want to wait for a detectable change in amphibian populations before responding?

In sum, there is no convincing rationale to indicate that the yellow and red light thresholds really trigger a quick response in land management practices. They seem primarily to trigger more

G10-46 studies, which must have conclusive results before reacting. It can take years to achieve conclusive results in wildlife studies.

The Plan further states that a scientific review panel of independent experts will be convened to resolve disputes between Simpson and the Services (AHCP v1 5-56). But the panel really comes down the one person. It is stated that the panel will consist of one Simpson appointee, one Services appointee, and a third person agreed upon by the two appointees. That third person may be the only independent panelist. In the case of a dispute between Simpson and the Services, the panel goes to a vote. Majority rules; 2 out of 3 wins it, so it could come down to the third panelist either agreeing with Simpson or the Services. Additionally, no adaptive management changes will be made unless there is a sufficient balance in the Adaptive Management Reserve Account (AMRA). It seems that if habitat conditions degrade with continued harvest, the

G10-47 AMRA could be quickly depleted rendering the yellow and red light thresholds meaningless. The AMRA can also be depleted by translating FSA to funds for road prescriptions (AHCP v1 6-58) at a rate of 2% per year, or 100% by the end of the 50-year plan. Many of the monitoring measures will not produce results for 5 to 15 years, often only triggering further study before reaction. By the time there is an adaptive management response, there may be very little left in the AMRA. If yellow-light thresholds are exceeded, "management change will only be made to the extent of the availability of a balance in the AMRA" (AHCP v1 6-55), but it is not clear whether the red light thresholds are subject to the same limitations. There is a process to add credit to the AMRA, but it seems a like shell game, moving credits around without any real additions (AHCP v1 6-58). There is a provision for adding new area to the "Plan Area" after the Plan is approved. Does this include adding more FSA to the AMRA when new area is added?

I. Reference Sites

G10-48 Although we are unaware of data on pre-harvest amphibian densities for this area, we believe that the covered species currently occur at lower than historic densities in the Plan Area as a result of previous timber harvest operations. The tailed frog and southern torrent salamander have shown declines following timber harvest (Welsh 1990, Ashton 2002, others). Both species still occur on Simpson timberlands despite decades of timber harvest (Diller and Wallace 1996, 1999). A combination of features may reduce harvest related impacts to these species in the Plan Area. The maritime climate helps stabilize stream temperatures; consolidated parent geology minimizes fine sediment delivery to watercourses; and higher gradients help flush sediments through the aquatic system. The persistence of these species on Simpson lands is more a result of abiotic properties of the landscape, than of biotic tolerance of past forest practices.

Response to Comment G10-49

Biological goals and objectives have been discussed in AHCP/CCAA Section 6.1 and Master Response 12.

Basis for Biological Goals and Objectives.

Green Diamond established the biological goals and objectives of its Plan in consideration of common needs and habitat preferences shared among the six aquatic covered species. Although the specifics vary, all of the covered species are adapted to relatively cool water temperatures, and require streams with complex habitat both in terms of stream morphology and substrate composition. Each of the covered species exhibit life history variability, with the result that different portions of their life cycles depend on freshwater habitat. Of the fish species, Chinook salmon spends the least time in freshwater where the spawning and estuarine rearing habitats are the most critical freshwater elements. In comparison, coho salmon and steelhead generally spend up to two years or more of their life in freshwater habitat so that spawning, and summer and winter rearing habitats are important. Most of the coastal cutthroat trout probably spend their entire lives in freshwater. This fish species is completely dependent on the freshwater habitat, although some individuals of certain populations may exhibit anadromy. The amphibian species spend their entire lives within relatively small areas in the upper reaches of watersheds, although the adults of both species are terrestrial and presumably capable of limited overland movements during certain times of year. Based on these considerations, Green Diamond has established the five goals and five objectives to reflect in biological terms the intended result of the proposed conservation program. The Services have, as the commenter

Selecting second-growth forests as reference sites for monitoring may mask declines because the reference populations may already exhibit a depressed state. Populations of the covered amphibian species in the Plan Area should be compared to populations in late-seral forests with similar physical attributes, for example, comparison of Simpson holdings vs. Prairie Creek Redwoods State Park. Previous work has shown an average density of 0.724 southern torrent salamanders per hour in ten streams in PCRSP (Welsh and Ollivier, *unpublished data*), while Wroble and Waters (1989) reported densities of 0.052 southern torrent salamanders per hour in 17 streams on PALCO lands (*see* Welsh et al. 1998). Control sites for the BACI design experiments are also on second-growth timberlands. The BACI design may be useful for detecting changes within the second-growth system, but it should be made clear the "before" only refers to "before" the proposed impact (future harvest) and it does not mean before all timber harvest in the Plan Area. A BACI design experiment should be conducted using late-seral forests as the control, but it would be difficult (or impossible) to find late-seral reference sites in close proximity to some of the treatment sites. Still, there would be some value in comparing the reference sites (second-growth) with late-seral forests (Mulder et al. 1999).

G10-48

V. DETAILED SECTION-BY-SECTION COMMENTS ON AHCP

This section steps through the core conservation commitments made in this proposal, generally according to the sequence in which they are presented.

A. Biological Goals and Objectives

G10-49

Section 6.1, Biological Goals and Objectives, contains contradictory language. While the introduction states that to comply with the terms of an HCP, the conservation measures must minimize and mitigate the take of listed species and ensure that such take does not reduce the survival or recovery of the listed species, the objectives section states that, "the permittee's obligations for meeting the biological goals and objectives are met via proper implementation of the conservation program of the AHCP. Thus, a permitte is only required to implement the operating conservation program of the HCP, regardless of its effect on Covered Species. We recommend that Section 6 be re-written and peer-reviewed with attention both to the substance of the goals and objectives and to establish a direct relationship to Plan compliance through the monitoring and adaptive management provisions.

For purposes of this review, although the Services apparently do not propose to use either the biological goals or the objectives of the Plan as performance measures[1], these objectives nonetheless deserve careful scrutiny in that they are described as the functional goals of the

[1] According to Simpson: "Permittees are not required to achieve the HCPs biological goals or objectives to comply with their permits. Rather than being enforceable terms or conditions, the goals and objectives guide the development of the operating conservation measures. . . ." "the permittees obligation for meeting the biological goals and objectives is proper implementation of the operating conservation program of the HCP. In other words, to qualify for No Surprises assurances, a permittee is required only to implement the operating conservation program of the HCP; the IA, if used, and the terms and conditions of the permit. . . .

suggests, carefully reviewed the biological goals and objectives. However, we emphasize that it is evaluation of the Operating Conservation Program, not the biological goals and objectives that determine whether the Plan meets ESA Section 10 Permit approval criteria (see Master Response 8). The Services believe that the Operating Conservation Program meets the requirements of ESA Section 10 and the commenter provides no basis to conclude otherwise.

Temperature Objective.

As noted above, each of the covered species has adapted to relatively cool water temperatures, and requires streams with complex habitat both in terms of stream morphology and substrate composition. Implementation of the riparian management measures (AHCP/CCAA Section 6.2.1), together with the other measures in the Operating Conservation Program, will minimize and mitigate the impacts of take to the maximum extent practicable and ensure that permitted take does not appreciably reduce the likelihood of survival and recovery of the covered species in the wild. Information regarding temperature monitoring data from outside Green Diamond's ownership was not used because sufficient temperature information from within the Plan Area was available to judge the impacts and measures outlined in the Plan. Finally, implementation of the Operating Conservation Program, including the riparian management measures (AHCP/CCAA Section 6.2.1), address concerns regarding thermal refugia. Regarding the environmental baseline, see Master Response 1.

Large Woody Debris Objective

See Master Response 18.

Amphibian Population Objective

Comments regarding baseline conditions are addressed in Master Response 1.

A detailed explanation for the southern torrent salamander population monitoring objective is provided in AHCP/CCAA Section 6.3.5.2.5.2 and Appendix D.1.6.3. Class III streams will be extensively monitored under the Plan, as discussed in AHCP/CCAA Section 6.3.5.3.2 and Appendix D.2.3.

Sediment Objective.

The potential for increased sediment input has been identified as a potential impact to the covered species and their habitats (AHCP/CCAA Section 5.3; AHCP/CCAA Appendix E). Implementation of the road management measures and harvest-related ground disturbance measures (AHCP/CCAA Sections 6.2.6.2.3 and 6.2.4) will reduce sediment delivery to watercourses, which in turn, will improve conditions relative to current conditions and the No Action Alternative for the benefit of the covered species and their habitats.

Monitoring and Adaptive Management

As discussed above, AHCP/CCAA Section 6.1 provided a basis for the development of the Operating Conservation Program provisions, including the monitoring and adaptive management measures (see AHCP/CCAA Section 6.2.5 and 6.2.6). Therefore the biological objective for monitoring and adaptive management is not "superfluous" but instead provided a foundation for enforceable provisions of the Plan. Regarding adaptive management, see responses to Comments C4-6, C4-29, G3-58, G3-59, G3-67, G3-72 through and including G3-77, G3-86, G5-2, G10-15, G10-53, G10-51, S1-14, and S5-32, among others.

proposed management measures. The question asked was: if these goals and objectives actually were met by a proposed management regime, would such a regime be adequate to conserve the covered species? This review finds that the answer is no. The panel is further concerned by the apparent disconnect between these objectives and the monitoring plan.

The four biological "goals" stated on 6-3 are intended to provide the context for the objectives. The first goal, to "[m]aintain cool water temperatures that are consistent with the requirements of individual species" is appropriately based on the needs of the covered species, but the term "consistent with" is not defined. The second goal, to "[m]inimize and mitigate human-caused sediment inputs" cannot be properly termed a biological goal as it does not limit human caused sediment inputs in relation to the biological needs of the covered species in any way. The third goal, to "[p]rovide for the recruitment of LWD into stream so as to maintain and allow the development of functional steam habitat conditions" depends heavily on the undefined term "functional stream habitat conditions," and does not speak to the rate at which development of such conditions must be allowed to occur relative to unmanaged. The fourth goal is to "[a]llow for maintenance and increase of populations of the amphibian Covered Species in the Plan Area through minimization of timber harvest-related impacts on the species," appropriately stated an intent to limit harvest related impacts to some level that would allow conditions to improve for amphibian populations.

Concerns regarding the biological "objectives" are discussed below.

1. Temperature Objective

This is the most quantitatively stated of all the objectives: to remain "below the upper 95% PI" as described by a regression equation. The goal applies only to 4th order or small Class I and II watercourses w/drainage less than 10,000 acres. The key problem with this objective is that it in no way attempts to reflect the biological needs of the covered species. Rather, it reflects an existing average that changes depending on the size of the watershed. The current environmental baseline should not be considered the management objective for this plan. A plan designed to meet this goal would merely lock in the current temperature regime, a regime that reflects the legacy of past management. See also comments in Section __ infra regarding the temperature analysis.

There are further concerns about the representativeness of the samples used. There is no explanation for why existing data from streams outside of Simpson ownership were not relied upon. For example, there have been long term temperature monitoring studies on Prairie Creek, as mentioned above at Section IV.J.

The objective is further eroded by the statement that it will only operate to the extent that temperature fluctuations are "[n]ot attributable to annual climatic variation." There is no explanation as to how Simpson plans to "adjust" for climatic variation (or drainage area effects), how they plan to isolate for such effects or what type of fluctuation qualifies for the exemption. We suggest that this is an unworkable framework for this objective and is not defensible. In fact,

it is unarguably the net effect of management-induced change and such climatic variation that determines the biological consequences of stream temperature. A principal effect of management may be to render waters more vulnerable to climatic influences, e.g. by opening canopy, changing windspeed, reducing baseflows, and disconnecting surface flow from intragravel flow by sediment infilling of the bed. The full effects of these man-made changes will not be expressed until they are tested by climatic extremes.

Lastly, there is no objective that recognizes the significance of thermal refugia to the continued persistence of covered species on a highly managed landscape where suitable habitats are fragmented. Because utilization of these refugia is a key survival strategy for salmonid fishes (Ozaki 1988; Nielsen et al. 1994; Matthews et al. 1994; Torgerson et al. 1999; Coutant 1999; Poole and Berman 2001; Ebersole et al. 2001) and other coldwater biota in this region, protection and restoration of such refugia should be an explicit management objective.

2. Large Wood Objective

"The biological objective for LWD is to increase the abundance and size class of in-channel and potential LWD in watersheds in the Plan Area." AHCP at 6-5. This is a strategy, not an objective. An objective specifies a desired outcome.

Quantitatively, the objective is for riparian areas to be "99% stocked" with "stands greater than 60 years" and "70% stocked" with "stands greater than 80 years." Also, "the potential recruitment based on managed potential tree height will be greater than 80 and 70% attainment for Class I and II watercourses respectively." There are several critical problems with this objective.

First, this "mature" stand is an industrial rather than ecological characterization of conditions that are expected to increase LWD. This stand condition is not an objective for LWD, but a strategy based on an industrial forestry definition for "mature." Note the provision that at the end of 50 years, Simpson can propose another 50-yr provision, i.e., another entry into the industrially "mature" riparian stands. A longer-term vision of "mature" is needed.

Second, it appears that this objective is based on projections of what is attainable in terms of stocking levels under the proposed Plan prescriptions, which is a bootstrapping means of determining a plan's objectives. This objective should be based on a determination of what is necessary to adequately provide for the covered species, and the metric should focus on measures that have a high likelihood of producing those conditions.

Third, this objective implies that all sources of LWD will be stream adjacent riparian areas. No attempt has been made to characterize the sources of LWD under historic conditions, which included upstream and upslope sources.

Fourth, this objective provides a foundation for management prescriptions that would allow the harvest of all older trees, so long as the dominant age class is over 60 years and 80 years,

respectively. This would create conditions where there is no available source of large key pieces. The largest trees play a critical role in habitat formation and sediment regulation, and in maintaining relative stability of habitat-forming debris jams in the face of accelerated sediment loading.

Fifth, this objective needs clarification to be given meaning. For example: What are the units of the objective? Stem counts? The stem density of recruitable trees is necessary to evaluate the relationship of this objective to large wood supply

Lastly, there is no associated provision in the plan to monitor attainment of this objective. There is only required to be a 10 year inventory of large woody debris.

3. Amphibian Population Objective

Simpson's stated goal is "maintenance or increase of populations of the amphibian Covered Species in the Plan Area through minimization of timber harvest related impacts on the species."

As with the temperature goal, this states a goal of no change from the current baseline. Given that the entire Plan Area and its immediate surroundings have been intensively logged, existing conditions do not state an appropriate baseline. Another problem is that the stated objective inappropriately relies on a metric that registers only the presence or absence of the Southern Torrent Salamander. One animal should not be used to indicate the presence of a healthy or viable population. Mere "occurrence" should not be the metric used to assess amphibian populations.

Further concern with this objective arises upon reviewing the monitoring plan because Class III streams are not included. Yet Class III streams provide much of the salamander habitat under current distribution. If Simpson truly intends to manage for the upstream extent of these animals, as they have long contended they do in their mapping, then they should be monitoring the Class III streams to ensure this is the case.

4. Sediment Objective

The stated goal is "minimize and mitigate" human caused sediment inputs. However, the sediment objective is not biologically based. There is no unit of biology nor metric related to habitat suitability.

There is no acknowledgement that contemporary levels of suspended sediment reflect past and current forest management within the planning area. We note that nearby Pacific Lumber lands were subject to a cease and desist order for violating the 20% over background standard (California North Coast Regional Water Quality Control Board 2000).

Response to Comment G10-50

The comment acknowledging that current riparian conditions will improve under the Plan is noted. A discussion of the Operating Conservation Program and the CFPRs is provided in Master Response 7. The ESA requires that its Section 10 issuance criteria be met (See EIS section 1.3, AHCP/CCAA Section 1.4.1 and Master Response 8). This Plan provides an additional layer of restrictions and does not absolve Green Diamond of its ongoing legal obligation to comply with all applicable laws. The commenter suggests alternative protocols for riparian management. The ESA does not require avoidance of impacts to covered species, but that the issuance criteria for ITPs and ESPs be met. The Services believe that this Plan satisfies these requirements.

The use of the term "stem" in this case was intended to be used interchangeably with "trees." In the forestry industry, the terms are considered synonyms. The meaning of "likely to recruit" is discussed in Master Response 5. The ESA does not require permittees to "rehabilitate riparian areas currently devoid of mature redwoods" or otherwise "recover" the covered species or their habitats. Instead, as discussed above, it requires that applications meet the criteria for Permit issuance.

The selection of specific prescriptions, including riparian management measures, is a matter of the Permit applicant's discretion. HCP Handbook at 3-19. The Services' role during the development of a conservation program is to "be prepared to advise" and to judge its consistency with the ESA approval criteria once the application is complete. HCP Handbook at 3-6 and 3-7. The ESA does not require that any particular measure be adopted or imposed, but only that its criteria for Permit issuance be met. The Services believe that this Plan meets ESA standards.

5. Monitoring and Adaptive Management

G10-49

"The biological objective for monitoring and adaptive management will be to measure detectable changes in baseline biological conditions so as to make appropriate adjustments to the Operating Conservation Program to meet the Plan's goals. This is not a biological objective. It is a performance objective for the monitoring program to pick up "detectable changes" in "baseline conditions." The parameters to be measured in assessing baseline conditions are not actually identified here, making this objective superfluous.

B. Riparian Management Measures

G10-50

We acknowledge that in some respects the proposed plan appears to improve on current riparian protections, such as the stated intent to apply current state rules' Class II protection to streams seeps, springs and wet areas. This section focuses areas where plan measures fall short of current rules and/or may not have their intended effects due to uncertainties related to implementation.

1. Background Discussion of Riparian Delineation

Terraces are evidence of channel movement. They are defined as abandoned floodplains created under past climatic and geomorphic environmental settings (Leopold 1994). In contrast, floodplains are contemporary channel constructions, which under textbook conditions are just inundated by the bankfull discharge. A third type of channel surface exists throughout Northern California, a type that is flooded less frequently than by the bankfull discharge, but which still is constructed in the contemporary climate and geomorphic setting. For lack of a better term, these are aggraded floodplains. Woody riparian vegetation modifies local channel hydraulics. As riparian vegetation colonizes floodplains, vegetation resists flood flows, thus radically decreasing water velocities. A subsequent depositional environment evolves such that large floods are encouraged to deposit significant layers of fine sediment onto the contemporary floodplain. As deposition accrues, the flood necessary to just overtop a developing depositional floodplain increases. Typically, depositional floodplains exhibit a downward sloping surface away from the channel. More sediment, upon encountering low velocities during floods inundating the fringe of floodplain vegetation, is deposited close to the active channel (creating natural levees) than farther from the active channel. This downward sloping surface provides diverse microenvironments that favor stands of large conifers and hardwoods as well as backwater wetlands. In healthy river ecosystems, depositional floodplains have been major contributors of large wood. To recruit large trees, now and in the future, each must be allowed to grow big safely, but in locations ultimately vulnerable to lateral channel migration. This often requires being a considerable distance from the present channel to allow time to grow, while remaining within reach of the mainstem channel. Late-successional conifer stands associated with aggraded floodplains require developmental times greater than the age of one of its members. The riparian zone, by encompassing the active channel, the floodplain, and depositional floodplains, defines a dynamic river-dependent ecosystem highly dependent on fluvial processes that require

considerable space and time to function properly (Trush, McBain, and Leopold 2000; Bolton and Shellberg 2001; Poole and Berman 2001).

In order to be consistent with recovery of the covered anadromous salmonids, the proposed Plan must allow recovery of the riparian zone's structure and function throughout a watershed's drainage network. However, maintaining the integrity of the riparian zone is not solely a salmon issue. Other important beneficial uses are directly attributed to healthy riparian corridors (CFPR 2002; Bolton and Shellberg 2001) and their consideration is necessary under law. The CFPR clearly identifies goals of protecting and restoring the riparian zone.

CFPR 2002 Section 916.9(c) Protection and Restoration in Watersheds with Threatened or Impaired Values states: *Any timber operation or silvicultural prescription within 150 feet of any Class I watercourse or lake transition line or 100 feet of any Class II watercourse or lake transition line shall have protection, maintenance, or restoration of the beneficial uses of water or the populations and habitat of anadromous salmonids or listed aquatic or riparian-associated species as significant objectives.*

Section 916.2(a) Protection of the Beneficial Uses of Water and Riparian Functions states: *The measure used to protect each watercourse and lake in a logging area shall be determined by the presence and condition of the following values: (1) The existing and restorable quality and beneficial uses of water as specified by the applicable water quality control plan and as further identified and refined during preparation and review of the plan, (2) The restorable uses of water for fisheries as identified by the DFG or as further identified and refined during preparation and review of the plan, (3) Riparian habitat that provides for the biological needs of native aquatic and riparian-associated species, (4) Sensitive conditions near watercourses and lakes. These values shall be protected from potentially significant adverse impacts from timber operations and restored to good condition, where needed, through a combination of the rules and plan-specific mitigation.*

In short, there is ample regulatory language requiring the protection and recovery of riparian zones that goes beyond simply meeting minimum requirements set forth in the CFPR. An AHCP should excel at satisfying these regulatory mandates in scope and content.

2. Identifying the Riparian Zone

The foundation for sound riparian management would be to adopt the best (scientifically defensible, reproducible, and reasonably enforceable) protocol for establishing riparian zone boundaries. As explained above, riparian zones encompass the active channel, the geomorphic floodplain, and aggraded floodplains. Watercourse transition lines (WLTL), the terminology employed by the California Board of Forestry, should be considered identical to the riparian zone boundaries. The maximum stage height of twice the bankfull discharge (1.65-yr annual maximum flood) is the least ambiguous, most scientifically defensible technique for identifying the WLTL on Class I and Class II channels (Ligon et al. 1999)This measure should not be considered a surrogate measure for channel migration zone (CMZ) as quantified by the

Washington DNR method (Washington Department of Natural Resources 2001), nor should it be considered equivalent to the method described in the Simpson AHCP. The Washington DNR method relies on arbitrary timelines for "near-term" migration and assessments for "likelihood" of channel migration. Neither is scientifically defensible, reproducible, or enforceable (Washington Forest Law Center 2002). Criteria for the Simpson CMZ are described, but not defined. Instead, a future expert panel would determine how to designate CMZ boundaries.

The foremost concern here is actually not how CMZs are delineated, but rather why CMZs need to be delineated. As proposed, however, the CMZ designation does not meet any goal for riparian zone recovery. By eliciting arbitrary criteria using "near-term" and "likelihood" (as the Washington DNR method does and other field approaches would be required to do) it becomes necessary to speculate the necessary minimum condition (i.e., What is just enough?). This is not a recipe for recovery of aquatic ecosystems. Furthermore, the proposed procedure of CMZ designation does not account for riparian beneficial uses other than those associated with anadromous salmonid habitat needs. Riparian ecosystems are one of the most endangered worldwide. Last, due to arbitrary criteria, the wide range of expertise and bias likely encountered, and the remote location of many channels, inadequate oversight by CDF, riparian management requiring CMZ designation is not scientifically defensible, reproducible, or reasonably enforceable. Rather than designate CMZs, the floodplain boundary should be objectively identified as the WLTL (Ligon et al. 1999).

(a) Under the proposed Plan, CMZ delineation could fall short of the watercourse transition line during implementation. Simpson proposed to apply twice the maximum bankfull depth criterion to establishing a "floodplain" boundary (same as "riparian zone") which may, or may not, correspond to the WLTL. The Plan's definition for CMZ (e.g. Draft EIS p.7-2) is: *"the area of channel defined by a boundary that generally corresponds to the modern floodplain, but may also include terraces that are subject to significant bank erosion"*. When the CMZ boundary coincides with the floodplain boundary, the WLTL also is placed there. Smaller, partial-alluvial third order stream channels typically have evidence of recent channel migration throughout their floodplains. The Plan also allows locating the WLTL within the floodplain boundary (i.e., within the riparian zone). This is likely to occur in larger 3rd order alluvial channels where back portions of the riparian zone can support small stands of large conifers. The CMZ could be located on the streamside margin of these stands (e.g., using the Washington DNR method) with the justification that the channel has not migrated through the stand in the "near-term." This CMZ boundary becomes the WLTL (Section 6.2.1.1, p. 6-7), thus allowing harvest of conifer stands within the floodplain. Depending on its application, it appears this classification may lead to setting very narrow riparian widths – thus leaving vital conifers "outside" the truly functional RMZ where they would be subjected to a THP's clear-cutting. Another likely scenario would allow location of the WLTL within the floodplain under the proposed plan. If a channel is determined to not migrate (e.g., the Washington DNR method has an office protocol for this determination), Simpson could use its basic definition for locating the WLTL (EIS p. 7-14): *that line closest to the watercourse where perennial vegetation is permanently established*. This is the old WLTL definition not in use by California Board of Forestry in Northern California. Under this scenario, most of Simpson's Class I channels would most likely be labeled non-migratory.

This allows harvest of large conifers within the floodplain boundary on smaller channels that do not have a conspicuous floodplain, but rather a short bench. CMZ designation will not accomplish riparian zone recovery as mandated in CFPR 2001 (or less restrictive CFPR 2002) or meet the AHCP goals.

In the Plan, determination of the CMZ is instrumental in establishing the WLTL on more alluvial channels particularly important as coho rearing habitat, but floodplain designation (using twice maximum bankfull stage) is not. Instead, the floodplain designation is used to establish the outer boundary of the RMZ (federal) or WLPZ (state) (Section 6.2.1.1, p. 6-7). Depending on local channel characteristics, the Simpson plan would allow staff/agencies doing the field assessment of the CMZ (p. 6-13), and the presence/extent of large conifers, to prescribe the harvest of conifer stands within the floodplain.

(b) The screening process directing floodplain and CMZ field assessments is not clear (p. 6-13). Many Class I channels migrate over a distance no more than one or two times their present bankfull width. A GIS analysis cannot adequately screen these channels. Of great concern is whether a general rule or office procedure (such as exists in the Washington DNR method) will exclude most Class I channels by "determining" no migration is occurring or no floodplain exists. All these channels would then have the WLTL placed at the first line of permanent vegetation (using the Plan's definition), which in Northern California is typically well below bankfull stage (let alone twice bankfull stage). Section 6.2.1.1.2 (p. 6-7) incorrectly implies that the Plan's WLTL corresponds to the bankfull channel. The elevation of the Plan's WLTL also is well below that of CFPR 2002 for Class I watercourses. In most small and steep Class I watercourses, relatively short segments, such as at sharp bends and backwaters from downstream channel constrictions, will be wider and thus have floodplains and/or prominent benches within the riparian zone. These segments are biological hotspots for channel and riparian diversity. A GIS screening process would not adequately identify these unique reaches.

3. Impacts of Large Wood Depletion are Significant

Historically, large wood, particularly large redwoods, played a key role in regulating channel processes. When large redwoods entered streams due to blowdown, bank undercutting or mass wasting they often remained as functional stream elements for centuries. Given the pervasive harvesting of redwoods in this region – with most of the early harvesting in streamside areas – stream ecosystems have been significantly altered (Welsh et al. 1998).

There is clear indication in the language explaining the conservation measures that Simpson does not believe that it has any legal duty under the ESA that could arise as a result of harvest-related depletion of large wood sources. See e.g. 7-14 stating that while there is the potential for "potentially significant long term negative impacts" from depletion of large wood supplies, that this impact is not identified as falling within the legal definition of "take." Rather this kind of action simply "has the potential to result in long term impacts other than "take." Thus, the plan admits that large wood is a critical habitat component that requires a thorough assessment of